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1. **This submission is for Oral presentation**
2. **The targeted symposiums is B**

Multifunctional Strategies in Supercapacitors: Tailored Electrodes and Solid-State Electrolytes for Asymmetric and Symmetric Systems

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Asymmetric and symmetric supercapacitors continue to attract significant attention due to their complementary advantages in energy storage performance. While asymmetric devices are primarily developed to enhance energy density through optimized electrode material combinations [1], symmetric devices benefit greatly from advances in flexible carbon-based electrodes and novel solid-state electrolytes, which improve stability and mechanical adaptability [2].

Recent efforts in electrode synthesis techniques have yielded high-capacity materials suitable for asymmetric configurations, paired effectively with biomass-derived carbons to maximize performance. Simultaneously, the integration of liquid crystal-based gel electrolytes with flexible carbon nanomaterials in symmetric systems has demonstrated improved energy storage capabilities, outperforming traditional KOH–PVA electrolytes and offering enhanced thermal stability, particularly in microscale device formats.

This overview will highlight these dual approaches, emphasizing how innovations in both electrode materials and electrolyte design are critical for pushing the boundaries of supercapacitor performance and enabling versatile, flexible energy storage solutions.